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09/889,913	12/13/2001	Kineo Matsui	MES1P043	3027

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EXAMINER	
HENNING, MATTHEW T	

ART UNIT	PAPER NUMBER
2131	

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/889,913	MATSUI, KINEO	
	Examiner	Art Unit	
	Matthew T. Henning	2131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This action is in response to the communication filed on 4/3/2006.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 4/3/2006 have been fully considered but they are not persuasive.

Regarding applicant's argument that Inoue did not disclose comparison between two blocks, the examiner does not find the argument persuasive. Although Inoue does not explicitly state that the blocks are "compared", Inoue does disclose determining the "mean" of the coefficients of the blocks, as can be seen in Col. 46 Lines 5-15 as well as Fig 14. Calculating the mean coefficient of a group of blocks is a comparison of all the blocks in order to determine the average coefficient between the group of blocks, and as such falls within the scope of comparing coefficients between at least two blocks. This is analogous to finding the average height of the students of a classroom, in which the heights of the students must be compared in order to determine the average height. Furthermore, as seen in Col. 46 Lines 16-30, the mean coefficient is used in the embedding process. Therefore, the examiner does not find the argument persuasive.

Regarding applicant's arguments that the claimed method utilizes a smaller number of DCT coefficients, and other such "advantages" of the "claimed" invention, the examiner does not find the arguments persuasive. These "advantages" are not claimed, and as such have been given no weight. For instance, the claims do not recite nor imply nor require that the DCT coefficients which are used for embedding change according to the target image. As such, the examiner does not find the argument persuasive.

Because the arguments presented by the applicant have not been found persuasive, the examiner has maintained the previous prior art rejections below.

All objections and rejections not set forth below have been withdrawn.

Claims 1-20 have been examined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> *(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.*

Claims 1-4, 7-8, 13-14, and 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Inoue et al. (US Patent Number 6,477,276) hereinafter referred to as Inoue.

Regarding claim 1, Inoue disclosed a method of embedding a digital watermark in a master image (See Inoue Abstract and Figs. 12-14), said embedding method comprising the steps of: extracting blocks of a predetermined size from said master image (See Inoue Col. 45 Line 66 – Col. 46 Line 2); processing image data corresponding to each block by orthogonal transform (See Inoue Col. 46 Lines 2-5); comparing orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 46 Lines 5-15) and making the coefficients satisfy a preset order of magnitude according to bit information specified as the digital watermark, so as to embed the information (See Inoue Col. 46 Lines 16-

30); and processing each block with the embedded bit information by inverse orthogonal transform, so as output a resulting image with digital watermark embedded therein (See Inoue Col. 46 Lines 30-39).

Regarding claim 13, Inoue disclosed a method of decoding a digital watermark from a master image with the digital watermark embedded therein (See Inoue Fourth Embodiment Beginning in Col. 48), said decoding method comprising the steps of: extracting blocks of a predetermined size from said master image (See Inoue Col. 48 Lines 54-62 and Col. 45 Line 66 – Col. 46 Line 2); processing image data corresponding to each block by orthogonal transform (See Inoue Col. 48 Lines 54-62 and Col. 46 Lines 2-5); and comparing orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 48 Lines 62-67 and Col. 46 Lines 5-15) and extracting bit information, based on a preset order of magnitude that is applied to the coefficients (See Inoue Col. 49 Lines 28-38).

Regarding claim 17, Inoue disclosed an apparatus of embedding a digital watermark in a master image (See Inoue Abstract and Figs. 12-14), said digital watermark embedding apparatus comprising: block extraction means that extracts blocks of a predetermined size from said master image (See Inoue Col. 45 Line 66 – Col. 46 Line 2); transformation means that processes image data corresponding to each block by orthogonal transform (See Inoue Col. 46 Lines 2-5); bit information embedding means that compares orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 46 Lines 5-15) and making the coefficients satisfy a preset order of magnitude according to bit information specified as the digital watermark, so as to embed the information (See Inoue Col. 46 Lines 16-30); and output means that processes each block with the embedded bit information by inverse

orthogonal transform, so as output a resulting image with digital watermark embedded therein (See Inoue Col. 46 Lines 30-39).

Regarding claim 18, Inoue disclosed an apparatus of decoding a digital watermark from a master image with the digital watermark embedded therein (See Inoue Fourth Embodiment Beginning in Col. 48), said digital watermark decoding apparatus comprising: block extraction means that extracts blocks of a predetermined size from said master image (See Inoue Col. 48 Lines 54-62 and Col. 45 Line 66 – Col. 46 Line 2); transformation means that processes image data corresponding to each block by orthogonal transform (See Inoue Col. 48 Lines 54-62 and Col. 46 Lines 2-5); and bit information extracting means that compares orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 48 Lines 62-67 and Col. 46 Lines 5-15) and extracting bit information, based on a preset order of magnitude that is applied to the coefficients (See Inoue Col. 49 Lines 28-38).

Regarding claim 19, Inoue disclosed a recording medium in which a program for embedding a digital watermark in a master image is recorded in a computer readable manner(See Inoue Abstract and Figs. 12-14), said program causing a computer to attain the functions of: extracting blocks of a predetermined size from said master image (See Inoue Col. 45 Line 66 – Col. 46 Line 2); processing image data corresponding to each block by orthogonal transform (See Inoue Col. 46 Lines 2-5); comparing orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 46 Lines 5-15) and making the coefficients satisfy a preset order of magnitude according to bit information specified as the digital watermark, so as to embed the information (See Inoue Col. 46 Lines 16-30); and processing each block with the embedded bit information by inverse orthogonal

transform, so as output a resulting image with digital watermark embedded therein (See Inoue Col. 46 Lines 30-39).

Regarding claim 20, Inoue disclosed a recording medium in which a program for decoding a digital watermark from a master image with a digital watermark embedded therein is recorded in a computer readable manner (See Inoue Fourth Embodiment Beginning in Col. 48), said program causing a computer to attain the functions of: extracting blocks of a predetermined size from said master image (See Inoue Col. 48 Lines 54-62 and Col. 45 Line 66 – Col. 46 Line 2); processing image data corresponding to each block by orthogonal transform (See Inoue Col. 48 Lines 54-62 and Col. 46 Lines 2-5); and comparing orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 48 Lines 62-67 and Col. 46 Lines 5-15) and extracting bit information, based on a preset order of magnitude that is applied to the coefficients (See Inoue Col. 49 Lines 28-38).

Regarding claims 2 and 14, Inoue disclosed that the predetermined relationship between the at least two blocks is an arrangement of contiguity (See Inoue Fig. 13).

Regarding claim 3, Inoue disclosed that the orthogonal transform is a discrete cosine transform (See Inoue Col. 6 Lines 4-7).

Regarding claim 4, Inoue disclosed quantizing the coefficients obtained by the orthogonal transform with a quantization table and using the quantized coefficients to embed the bit information (See Inoue Col. 46 Lines 9-39).

Regarding claim 7, Inoue disclosed introducing a logic function that is true when a difference between the orthogonal transformed coefficients of the at least two blocks having the predetermined relationship is in a preset range; and modifying a procedure adopted to embed the

bit information, based on the true and false state of the logic function (See Inoue Col. 47 Lines 32-36 and Col. 40 Lines 1-30).

Regarding claim 8, Inoue disclosed providing a secret key corresponding to each coefficient (See Inoue Col. 47 Lines 32-36 and Col. 40 Lines 1-30 Logical Value), and modifying the procedure adopted to embed the bit information, based on the secret key corresponding to each coefficient and the true and false state of the logic function with regard to the coefficient (See Inoue Col. 40 Lines 1-30).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claims 4 and 13 above, and further in view of Vora (US Patent Number 6,463,162).

Inoue disclosed embedding data in the coefficients of discrete cosine transformed blocks (See Inoue Col. 46 Lines 1-39), but failed to disclose converting the image to the luminance-chrominance space prior to applying DCT to the blocks.

Vora teaches that in order to increase the space available for embedding, an image should be converted to the luminance-chrominance space prior to embedding (See Vora Col. 4 Lines 4-10).

It would have been obvious to the ordinary person skilled in the art at the time of invention to employ the teachings of Vora in the watermarking system of Inoue by converting the image to the luminance-chrominance space prior to watermarking. This would have been obvious because the ordinary person skilled in the art would have been motivated to increase the increase the information content of the watermark.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claim 4 above, and further in view of Bhaskaran et al. (US Patent Number 6,064,764) hereinafter referred to as Bhaskaran.

Inoue disclosed quantizing the coefficients of the DCT transformed blocks (See rejection of claim 4 above), but failed to disclose only embedding the watermark data where the coefficients are not zero.

Bhaskaran teaches that in order to keep the compression rate of the encoding of images, watermark data should not be added where DCT coefficients are equal to zero (See Bhaskaran Col. 5 Paragraph 2).

It would have been obvious to the ordinary person skilled in the art to employ the teachings of Bhaskaran to the watermarking system Inoue by only choosing coefficients that are non-zero to watermark. This would have been obvious because the ordinary person skilled in the art would have been motivated to increase the compression potential of the watermarked image.

Claims 9-10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claim 1 above, as evidenced by Johnson et al. ("Exploring Steganography: Seeing the Unseen") hereinafter referred to as Johnson.

Inoue disclosed providing a basic pattern as information of the digital watermark (See Inoue Col. 4 Lines 30-33), specifying each piece of binary information included in the provided basic pattern as the bit information as the bit information to be embedded (See Inoue Col. 47 Lines 32-34), and embedding the binary information of the basic pattern by setting the at least two blocks having the predetermined relationship to one unit (See Inoue Col. 47 Lines 34-47), and that embedding the basic pattern in the image data was done iteratively a predetermined number of times, when the number of elements constituting the basic pattern is greater than the number of extracted blocks (See Inoue Col. 47 Lines 48-57), but failed to disclose that the basic pattern was defined in a two-dimensional manner as a combination of binary information. However, it was well known in the art at the time of invention that the watermark data to be embedded into an image could also be an image and therefore it would have been obvious to the ordinary person skilled in the art at the time of invention to have embedded an image into the image data of Inoue.

This is evidenced by Johnson, wherein Johnson states that the data to be embedded in an image can be anything that could be embedded into a bit stream, including plain text, ciphertext, and other images (See Johnson Page 27 Col. 2 Lines 1-3).

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claim 9 above, and further in view of Ohbuchi et al. ("Watermarking Three-Dimensional Polygonal Modals"), hereinafter referred to as Ohbuchi.

Inoue disclosed embedding information (See rejection of claim 9 above), but failed to disclose the information being a density pattern.

Ohbuchi teaches that density pattern embedding in polygonal models withstands practically every geometrical transformation attack (See Ohbuchi Page 271 Col. 1 Section 3.5).

It would have been obvious to the ordinary person skilled in the art to employ the teachings of Ohbuchi in the watermarking system of Inoue by using a density pattern as the watermark. This would have been obvious because the ordinary person skilled in the art would have been motivated to provide watermark protection to polygonal models as well as plain images.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claim 13 above, and further in view of Rhoads (US Patent Number 6,122,403).

Inoue disclosed arranging the extracted bit information to restore the basic pattern; and decoding the digital watermark from the basic pattern (See Inoue Col. 50 Lines 10-15), but failed to disclose that the extracted information contained a repetitive pattern, or restoring such a pattern.

Rhoads teaches that when watermarking an image, the watermark size should be small and the mark should be repeated many times through the image (See Rhoads Col. 69 Paragraph 1).

It would have been obvious to the ordinary person skilled in the art at the time of invention to employ the teachings of Rhoads in the watermarking system of Inoue by repeating the mark through the image multiple times. This would have been obvious because the ordinary person skilled in the art would have been motivated to allow the watermark to be recovered from only a portion of the image.

Conclusion

Claims 1-20 have been rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew T. Henning whose telephone number is (571) 272-3790. The examiner can normally be reached on M-F 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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6/6/2006